

FROM the LAB to the INDUSTRIAL SCALE: EBC THERMAL SPRAY POWDERS

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The quality and performance of the feedstock material plays a key role in achieving a robust Environmental Barrier Coating (EBC) for Ceramic Matrix Composites (CMCs). As CMCs become commercialized there is a great need to implement the industrial-scale manufacture of EBC thermal spray powders from its current position as a laboratory-scale process. The challenges and the necessary development required to design a manufacturing process route from the raw materials to the RE-silicates thermal spray powder will be discussed. The fused and crushed (F&C) manufacturing process, including the new morphology of the agglomerated and sintered (A&S) RE-silicate powders, will be presented. The results of the influences of the process parameters on the evolved phases, particle size distribution, homogeneity, chemistry, purity and morphology will be discussed in detail. We will show that the selection of the best-performing material can be made based on the results from the correlations between flowability, apparent density, mechanical strength and morphology.